

Translation

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P802419/WO/1	FOR FURTHER ACTION		See Form PCT/IPEA/416
International application No. PCT/DE2004/000221	International filing date (day/month/year) 09.02.2004	Priority date (day/month/year) 19.02.2003	
International Patent Classification (IPC) or national classification and IPC C23C 4/12, 4/06, F16D 69/02, F41H 5/00			
Applicant DAIMLERCHRYSLER AG			

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 8 sheets, including this cover sheet.
3. This report is also accompanied by ANNEXES, comprising:
a. <input checked="" type="checkbox"/> (<i>sent to the applicant and to the International Bureau</i>) a total of 4 sheets, as follows: <input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions). <input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.
b. <input type="checkbox"/> (<i>sent to the International Bureau only</i>) a total of (indicate type and number of electronic carrier(s)) _____ , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).
4. This report contains indications relating to the following items:
<input checked="" type="checkbox"/> Box No. I Basis of the report
<input checked="" type="checkbox"/> Box No. II Priority
<input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
<input type="checkbox"/> Box No. IV Lack of unity of invention
<input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
<input type="checkbox"/> Box No. VI Certain documents cited
<input checked="" type="checkbox"/> Box No. VII Certain defects in the international application
<input type="checkbox"/> Box No. VIII Certain observations on the international application

Date of submission of the demand	Date of completion of this report
Name and mailing address of the IPEA/	Authorized officer
Facsimile No.	Telephone No.

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Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- This report is based on translations from the original language into the following language _____, which is the language of a translation furnished for the purposes of:
- international search (Rule 12.3 and 23.1(b))
 - publication of the international application (Rule 12.4)
 - international preliminary examination (Rule 55.2 and/or 55.3)
2. With regard to the elements of the international application, this report is based on (replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):
- the international application as originally filed/furnished
- the description:
pages 1-20 as originally filed/furnished
pages* _____ received by this Authority on _____
pages* _____ received by this Authority on _____
- the claims:
nos. _____ as originally filed/furnished
nos.* _____ as amended (together with any statement) under Article 19
nos.* 1-22 received by this Authority on 02.12.2004 with letter of 19.11.2004
nos.* _____ received by this Authority on _____
- the drawings:
sheets 1/2-2/2 as originally filed/furnished
sheets* _____ received by this Authority on _____
sheets* _____ received by this Authority on _____
- a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.
3. The amendments have resulted in the cancellation of:
- the description, pages _____
 - the claims, nos. _____
 - the drawings, sheets/figs _____
 - the sequence listing (specify): _____
 - any table(s) related to sequence listing (specify): _____
4. This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- the description, pages _____
 - the claims, nos. _____
 - the drawings, sheets/figs _____
 - the sequence listing (specify): _____
 - any table(s) related to sequence listing (specify): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

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Box No. II**Priority**

1. This report has been established as if no priority had been claimed due to the failure to furnish within the prescribed time limit the requested:
 copy of the earlier application whose priority has been claimed (Rule 66.7(a)).
 translation of the earlier application whose priority has been claimed (Rule 66.7(b)).
2. This report has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rule 64.1). Thus for the purposes of this report, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement	
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1. Statement

Novelty (N)	Claims	2, 6, 9, 10, 17-20	YES
	Claims	1, 3-5, 7, 8, 11-16, 21	NO
Inventive step (IS)	Claims		YES
	Claims	1-22	NO
Industrial applicability (IA)	Claims	1-22	YES
	Claims		NO

2. Citations and explanations (Rule 70.7)

1. The present report refers to the following documents:

D1: EP-A-1 176 228 (DAIMLER CHRYSLER AG) 30 January 2002 (2002-01-30)

D2: DE 198 41 618 A (DAIMLER CHRYSLER AG) 30 March 2000 (2000-03-30)

D3: EP-A-0 426 608 (LANXIDE TECHNOLOGY CO LTD) 8 May 1991 (1991-05-08)

D4: DE 196 32 598 C (DAIMLER BENZ AG) 11 December 1997 (1997-12-11)

- 1.1 D1, by the same inventors as the present application, discloses a tribologically and thermally highly stressable abrasion protection layer which can be used, for example, in motor vehicle construction, for example, in brake components. To produce this layer, a metal support element, for example, aluminium or iron, is used, which forms particularly good intermetallic phases with ceramic materials and at the same time is the structural material of the element to be coated. The layer can be generated *in situ*, if, for

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Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
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example, ceramic material, for example, titanium dioxide, is applied at temperature to the metal surface using an arc-wire spraying process, whereupon a reaction is initiated. The reaction produces intermetallic titanium aluminides (Al_3Ti) and TiAl) and Al_2O_3 . Metal or metal alloy portions in the deposited layer are not disclosed and should therefore be less than 10 vol.%.

- 1.2 Although D1 does not explicitly disclose a composite wire made of metal and ceramic particles, the term "arc-wire spraying process", which is explicitly used in D1 (cf. column 3, lines 19-20), suggests that such a wire is used, since it is presumably not straightforward to produce a **wire** consisting only of ceramic material, in particular TiO_2 , without ductile metal casing for use in arc-wire spraying devices. Therefore, it is assumed that the use of a composite wire, as defined in claim 1 of the application, is implicitly disclosed in D1. Corresponding filler wires belonged to the prior art at the priority date of D1 - see column 2, paragraph 1 of document D2, acknowledged in the application and by the applicant.
- 1.3 In the letter of 19 November 2004, the applicant argues that D1 does not disclose how the wire is formed and that "it can be assumed that ceramic fibres already well known to a person skilled in the art can be used as 'wire'". Therefore, the applicant continues, the assumption that in D1

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only composite wires are suitable is merely a supposition which does not lead to an implicit disclosure of these composite wires. In addition, the applicant contends, the method as per the application is not restricted to the formation of layers. Thus, the applicant concludes, both D1 and D2, which disclose methods suitable only for the formation of layered materials, give teachings that lead away from the subject matter of the application.

- 1.4 The applicant's arguments above are not convincing. To carry out the arc-wire spraying method, at least two conductive wires are required, to which voltage is applied. The examiner is not aware of any ceramic material which could be used without a metal casing or metal portion as a wire in an arc-wire spraying process. The applicant has not shown or even indicated what is the nature and composition of these "fibres that are well known to a person skilled in the art" and has not provided or cited any document in which such fibres are used for arc-wire spraying. Therefore, the applicant's arguments must be considered unsubstantiated. The claims do not exclude the deposition of layers. Therefore, the present documents continue to be relevant for the assessment of inventive step.

- 1.5 The disclosure of D1 is therefore prejudicial to the novelty of the subjects of claims 1, 3-5, 7, 8, 11-16 and 21.

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Box No. V

Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

- 1.6 D2 (acknowledged as prior art in the application) describes a filler wire having a TiO₂ proportion of 40 wt.%. D2 discloses further the possibility of using a combination of a filler and metal massive wire (cf. column 2, paragraph 4). The subjects of claims 2 and 6 are therefore not inventive. The subjects of claims 9, 10 and 17-20 relate to preferred embodiments which are well known to a person skilled in the art, such as the use of reactive gases during spraying and certain compositions and porosities which can be obtained by simple adjustment of the known method parameters. Composites of ceramics and metal which contain inter-metallic compounds and are used as a protective layer against ballistic impacts are known from D3 (cf. page 16, lines 33-43). These claims therefore do not contain anything inventive either.
- 1.7 With regard to the present claims, D4 does not disclose anything which goes beyond D1-D3 and is therefore not discussed any further in this report.
2. In the light of the comments above, claims 1-22 are deemed not to be novel and/or inventive and therefore do not meet the criteria of PCT Article 33.

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Box No. VII Certain defects in the international application

The following defects in the form or contents of the international application have been noted:

There is a typing error in claim 1 [German text only]:
the sentence "...und das Metall- oder die Metallegierung,
soweit reagieren,..." should read "...und **daß** das Metal or
die Metallegierung soweit reagieren...".